

UNIT IV

ADDITIONAL TOPICS

Module 1

TASK PACKAGING

TASK PACKAGING

Module Preview:

Introduction

- Introduction
- Definition and Concept
- Package Types
- Task Grouping
- Review and Summary

TASK PACKAGING

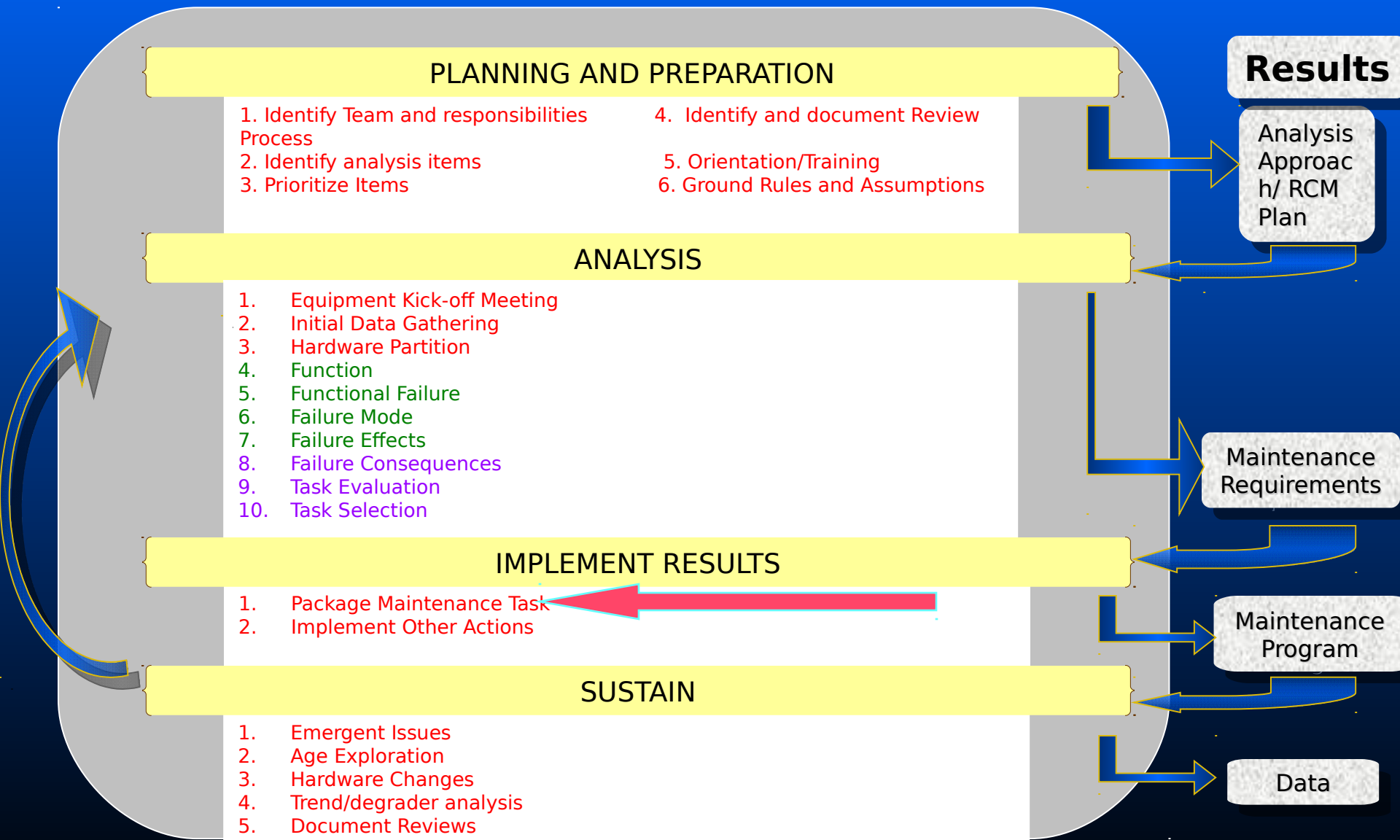
Module Objective:

Introduction

This module is designed to provide information on various issues concerning the packaging of PM tasks

- 1. Introduce the concept of maintenance task packaging**
- 2. Describe some of the different options for packaging maintenance tasks**
- 3. Identify some of the issues that can impact packaging decisions**

TASK PACKAGING



TASK PACKAGING

Packaging

Definition and Concept

The result of an RCM analysis is a set of recommendations for a series of discrete maintenance tasks.

TASK PACKAGING is the process of combining those discrete tasks into an efficient, effective, and executable maintenance program.

- Concurrent tasks combined into a set of “work packages”
- The objective is to minimize down-time and optimize use of resources

TASK PACKAGING

Units

Package Types

A typical maintenance program is made up of Work Packages based on common recurring units of measure:

- **Calendar time**
- **Operating units**
 - **operating hours**
 - **cycles**
 - **production units**
- **“For convenience”**
- **A Combination of the above**

TASK PACKAGING

Examples:

Package Types

Examples of Calendar Packages:

- **Daily**
- **Weekly**
- **10, 14, 28, 30 days**
- **Monthly**
- **Quarterly**
- **Semi-annually**
- **Yearly**
- **Etc.**

TASK PACKAGING

Examples:

Package Types

Examples of Operating Unit Packages:

- **Pre-start**
- **10, 50, 100, 1000 Operating Hours**
- **1000, 3000, 10000 Miles**
- **100 Landings**
- **1,000 Rounds Fired**
- **10 Starts**
- **10,000 units produced**
- **Etc.**

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For Convenience:

Package Types

“For convenience” Packages are performed in conjunction with some other event for convenience.

- Sometimes called **“conditional”** or **“opportunity”** maintenance

Examples of events that may be used for opportunity maintenance:

- Scheduled or unscheduled shut downs
- Specific maintenance events such as: inspecting components that require an engine removal for access during an engine removed for other reasons
- Refueling or replenishing operations

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For Convenience:

Package Types

Cautions:

- **Ensure maintenance is not performed just because there is an opportunity**
- **RCM intervals should not be exceeded if the “for convenience” opportunity is not provided**
 - **Mandatory for safety failure modes**
 - **May require combination with a “not to exceed” requirement**

TASK PACKAGING

Phased Maintenance:

Package Types

Phased Maintenance:

A set of recurring packages that allows work to be spread out over several packages. Allows a more even distribution:

- **Workload**
- **Resources**
- **Down-time**

TASK PACKAGING

Example:

Package Types

Phased Maintenance Example:

Tasks 1,2,3 are performed every 100 hours

Tasks 4,5 every 200 hours

Tasks 6,7,8,9 every 400 hours

Traditional packages would look like this:

100 hours: Tasks 1,2,3

200 hours: 1,2,3,4,5

300 hours: 1,2,3

400 hours: 1,2,3,4,5,6,7,8,9

(at 500 hours the 100 hour tasks start over)

Phased Packages might look like this:

100 hours: 1,2,3,4,6

200 hours: 1,2,3,5,7

300 hours: 1,2,3,4,8

400 hours: 1,2,3,5,9

(at 500 hours the 100 hour tasks start over again)

TASK PACKAGING

Grouping Factors

Task Grouping

The prior discussion centered on grouping tasks as a result of task frequency. There are many other factors that may influence the decision to group tasks:

- **Equipment location**
- **Equipment Complexity**
- **Trades/Skills required**
- **Availability of tools or parts required**
- **Down-time**
- **Elapsed Maintenance Time - Time required to complete the tasks**

TASK PACKAGING

Grouping Factors

Task Grouping

There are some additional points to consider when grouping tasks:

- **Task compatibility**
- **Sequencing**
- **Units conversion**

TASK PACKAGING

Task Compatibility

Task Grouping

Make sure that the tasks being packaged are compatible, for example:

- **One task requires equipment running while another requires it to be disassembled...**

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Task Sequencing

Task Grouping

Make sure that the tasks are sequenced in a way that is efficient and that does not impact the integrity of the tasks:

- **Perform the calibration AFTER after the inspection which requires disassembly...**

TASK PACKAGING

Units Conversion

Task Grouping

- In building a package it may be necessary to convert units of some tasks into the units of other tasks to organize them effectively
- Be cautious when converting a task from one metric to another since the conversion is an average and doesn't consider variation

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*Example of
conversion*

Task Grouping

For example, results of an RCM Analysis indicates that it is necessary to inspect a bushing in an attachment fitting for wear every 500 operating hours

If average equipment use were 50 hours per month, simple arithmetic may suggest that inspecting for wear every 10 months is acceptable

However.....

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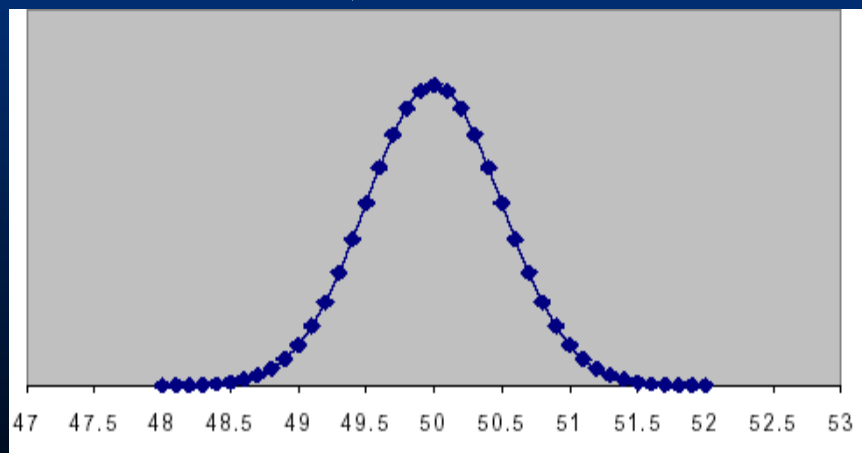
Example of conversion

Task Grouping

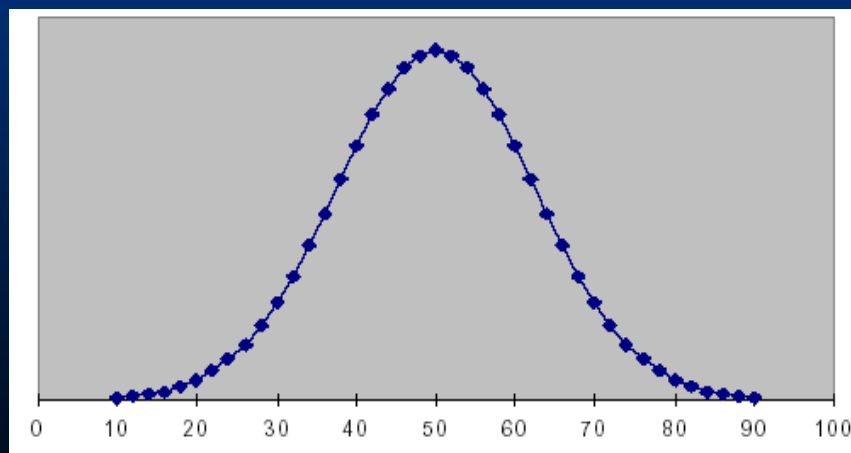
Consider the two distribution of equipment operating hours, Both show a average utilization of 50 operating hours

An inspection every 10 months may be adequate

An inspection every 10 months means that many systems will exceed 500 operating hours



Narrow Distribution



Wide Distribution

TASK PACKAGING

Review and Summary

Module Objective

This module is designed to provide information on various issues concerning the packaging of PM tasks

Introduction

- Learning Objectives

Definition and Concept

- Combining discrete tasks

Package Types

- Calendar, Operating units, Convenience, Phase

Task Grouping

- Grouping considerations

End of Module

up next.....

Sustaining the Analysis